THE ACCELERATION METHOD OF DEVELOPMENT OF TRANSVERSAL COMPETENCES IN STUDENTS' PRACTICAL TRAINING PROCESS.

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Agenda

- Origins of the project
- Method model
- Stages of the method
- Detailed presentation of selected results of project works
- A wider context of project work

The Acceleration Method of Development
of Transversal Competences
in Students' Practical Training Process

Erasmus+

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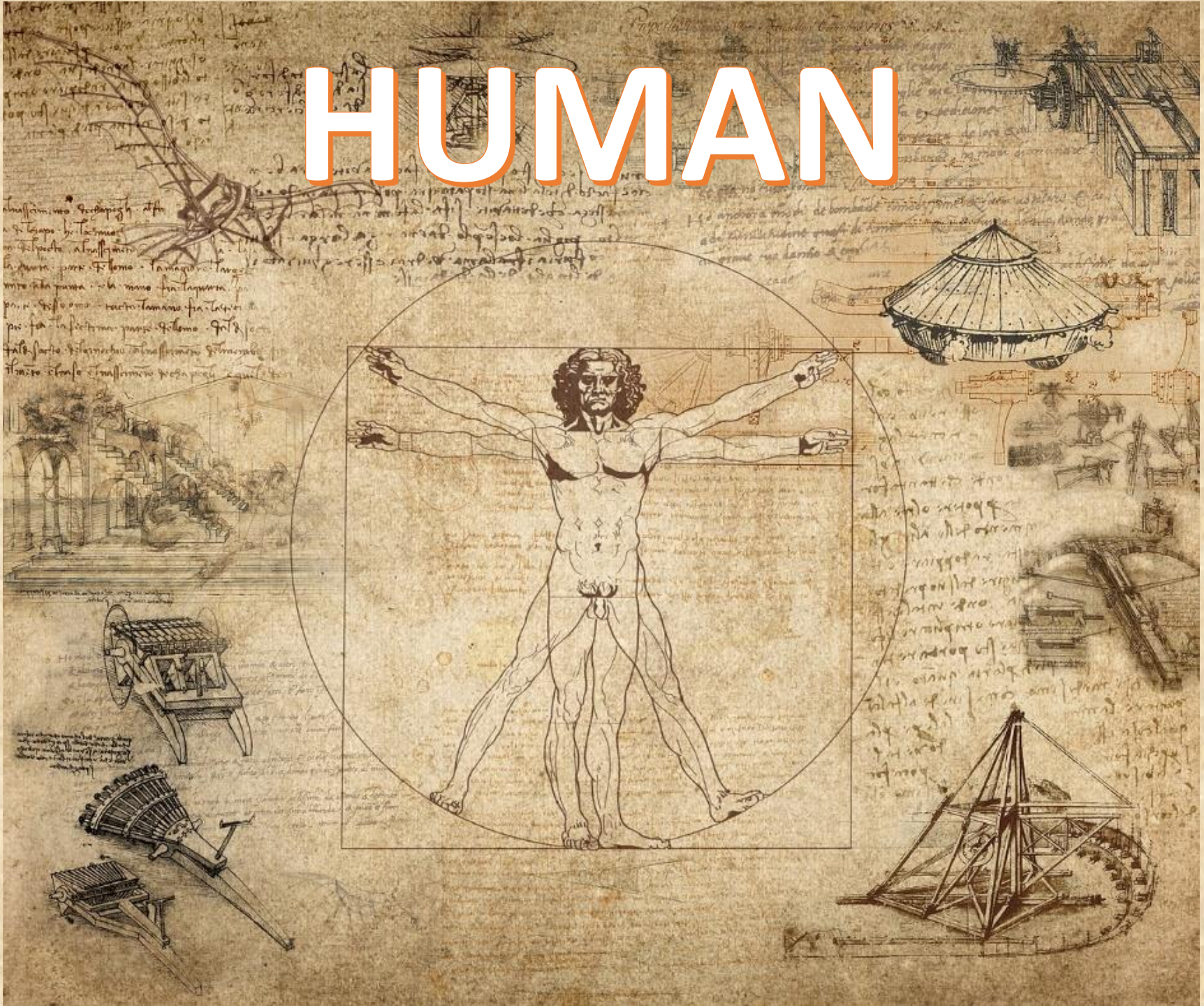
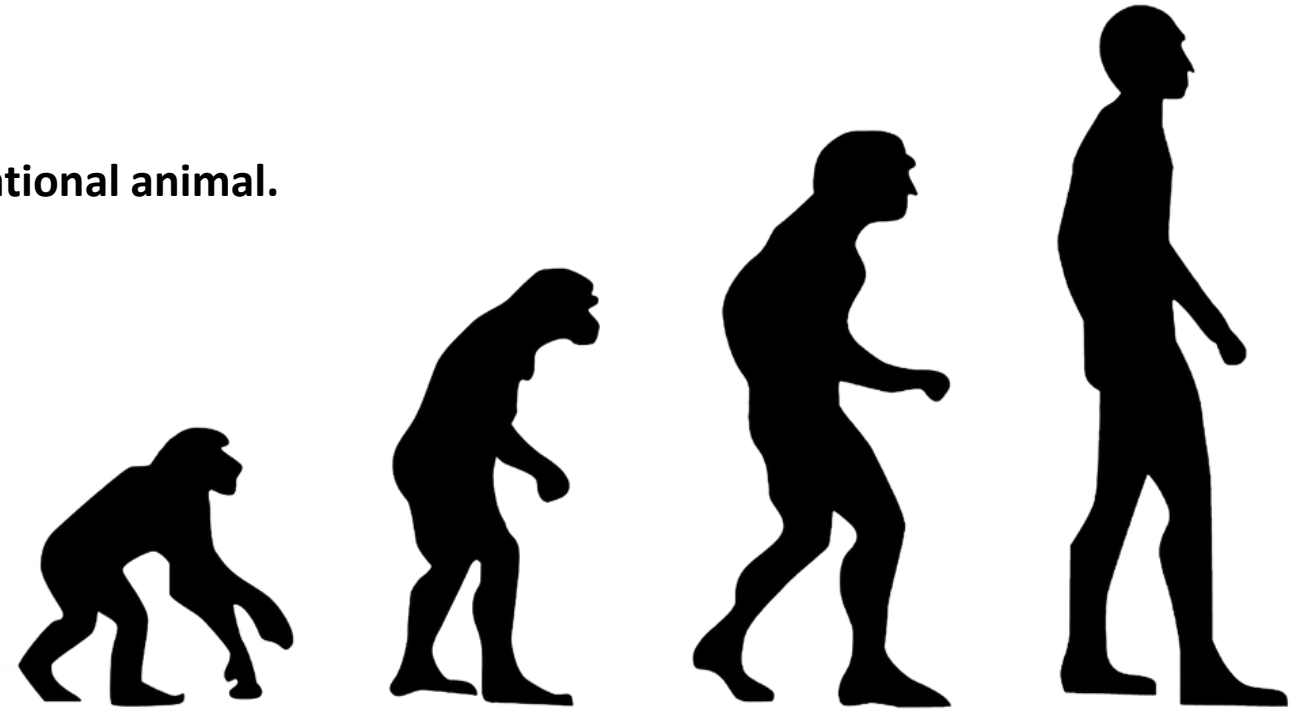
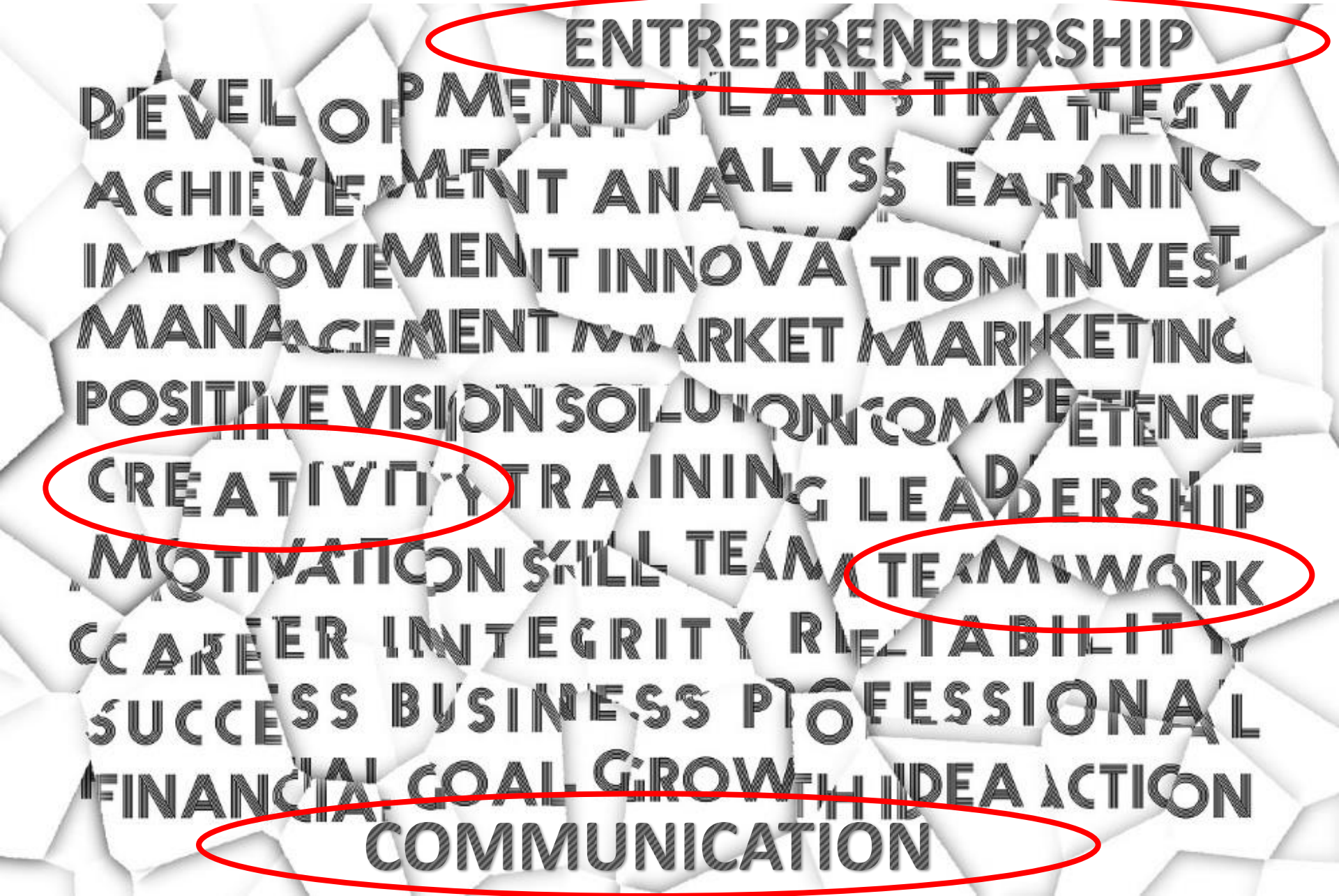

HUMAN

Man is just a rational animal.
Aristotle



An entity capable of social life and connecting itself with the community without breaking down its subjectivity and individuality.
Personalism Emmanuel Mounier

TRANSVERSAL COMPETENCES



It is necessary to

acquire transversal competences faster

Decision problem

How to do it?

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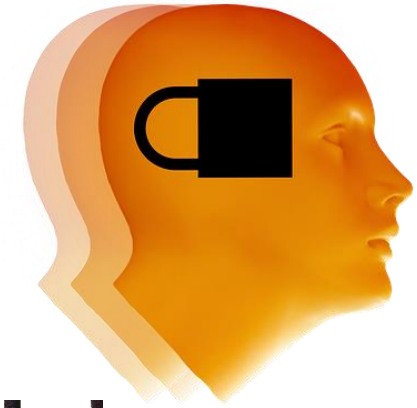
THE AIM OF THE PROJECT

to design an innovative acceleration method of development of transversal competences in STUDENTS' practical training process

- **Programme:** Erasmus+
- **Key Action:** cooperation for innovation and exchange of good practices
- **Action 2:** Stategic partnerships
- **Sector:** Strategic partnerships for higher education
- **Duration of the project:** 01 October 2015 – 31 August 2018 (35 months)

STUDENTS

PRACTICAL TRAINING



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METHOD MODEL

ACCELERATE
TRANSVERSAL
COMPETENCES

1. Analysis of applied methods of teaching transversal competences and practical teaching methods

2. Research into demand for transversal competences among entrepreneurs

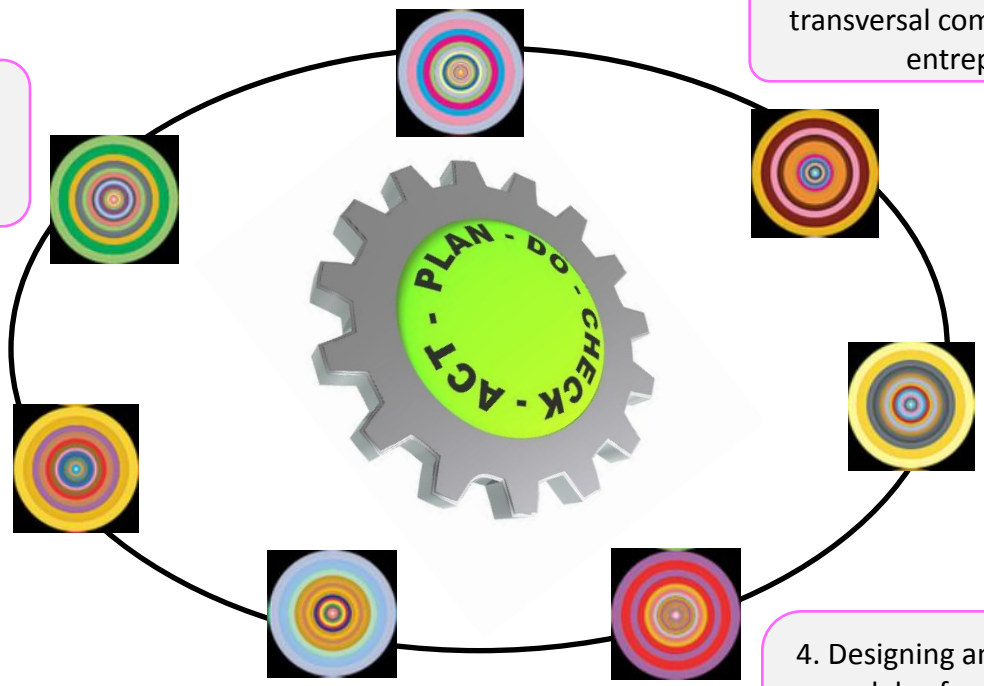
3. Developing a matrix of the dependencies of practical teaching methods and teaching transversal competences

4. Designing and testing models of processes developing transversal competences witnin practical competences

5. Development of the results of testing process models and drawing conclusions on their basis

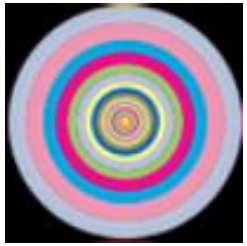
6. Selection of the most effective teaching processes or methods

7. Application of teaching processes



Stages of the method

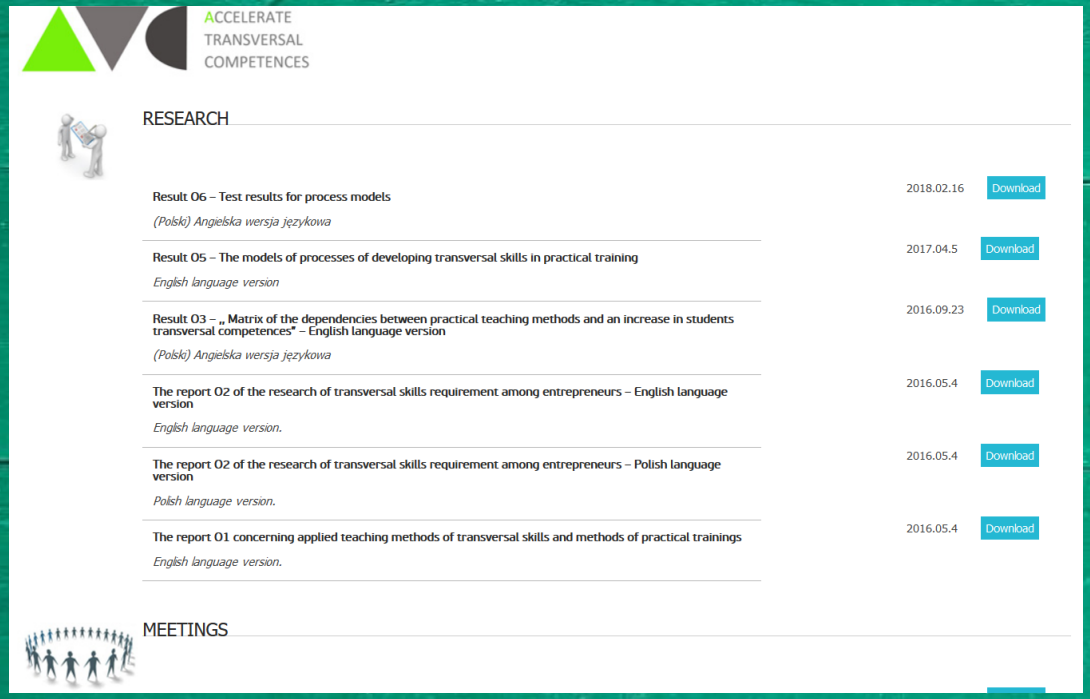
ACCELERATE TRANSVERSAL COMPETENCES



1. Analysis of applied methods of teaching transversal competences and practical teaching methods

Systematize the knowledge about transversal skills and methods of practical training or DOWNLOAD THE REPORT FROM OUR WEBSIDE

Generally create a base of knowledge about methods and competences in your or other countries



www.atcerasmus.eu (Download)

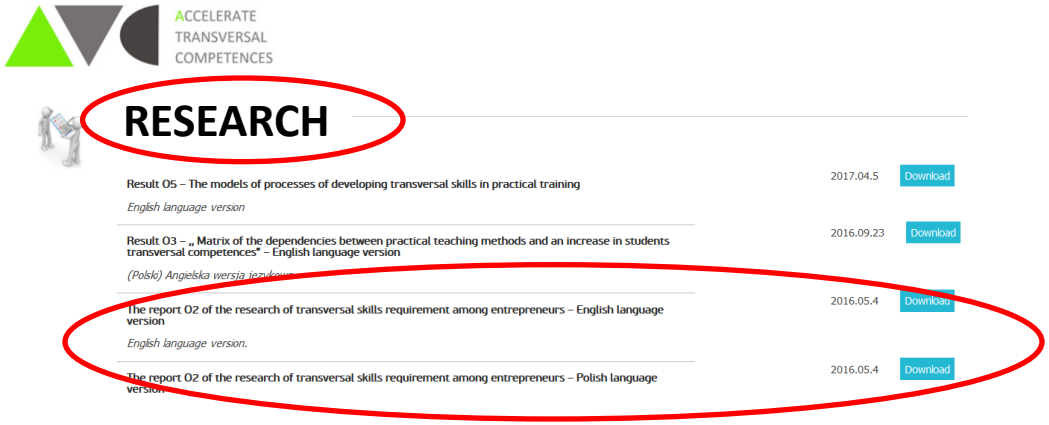
Stages of the method

ACCELERATE TRANSVERSAL COMPETENCES

2. Research into demand for transversal competences among entrepreneurs

Investigate, or at least find out, what transversal competences are useful in enterprises

The research method and the results of the research carried out in the project were presented in a report (in Polish and English). The report is also available on www.atcerasmus.eu



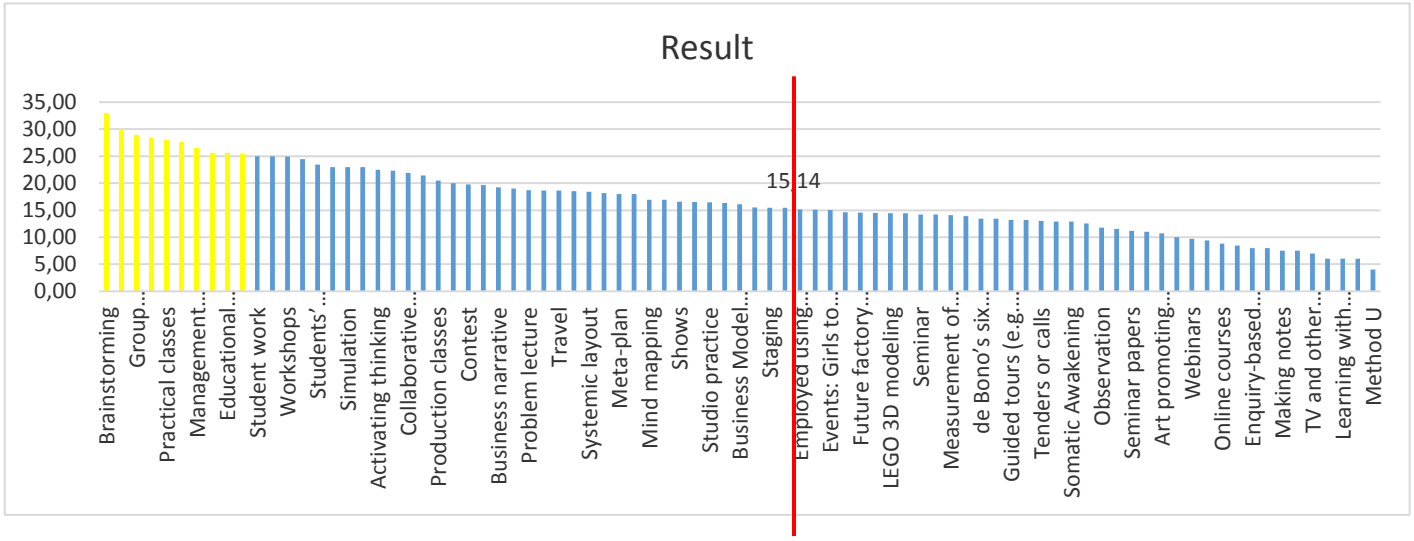
- The method catalogues transversal skills within 4 competences which were included in the project
- The research was designed so that it could easily be replicated internationally or even for one university

Stages of the method

ACCELERATE TRANSVERSAL COMPETENCES

3. Development of the matrix of the dependencies of practical teaching methods and teaching transversal competences

Practical teaching method	Entrepreneurship (E)	Creativity (Cr)	Communicativeness (Com)	Teamwork (T)	Group of methods	Result	Cumulative	Rank
Brainstorming	7,74	9,96	7,68	7,53	Problem-solving methods	32,91	32,91	1
Situated learning	4,39	5,23	4,08	16,32	Other methods	30,01	62,92	2
Group work/team work	5,16	5,48	8,16	10,04	Problem-solving methods/Activating methods	28,84	91,76	3
Exercises/trainings	6,97	6,23	7,44	7,78	Other methods	28,41	120,17	4
Practical classes	8,26	6,97	6,24	6,53	Practical methods	27,99	148,16	5
Case study	8,26	7,97	4,80	6,53	Problem-solving methods/Activating methods	27,55	175,71	6



The results of expert tests were revised taking into account the factors of usefulness of transversal competences for enterprises

Stages of the method

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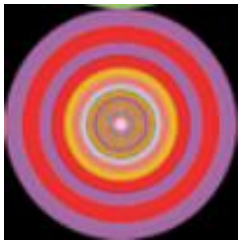
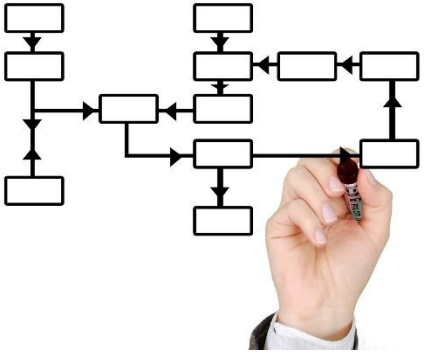


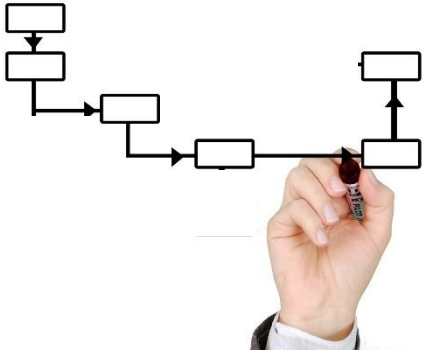
4. Design and testing of models of processes developing transversal competences as part of practical training.

Process 1



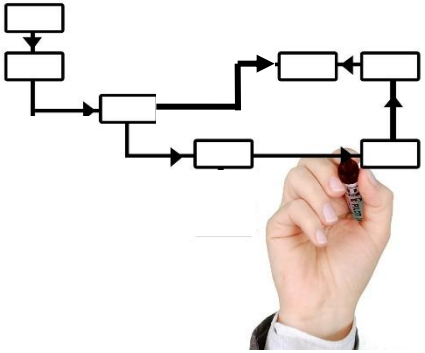
TEST 1

Process 2



TEST 2

Process n



TEST n

Stages of the method

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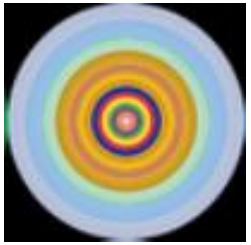
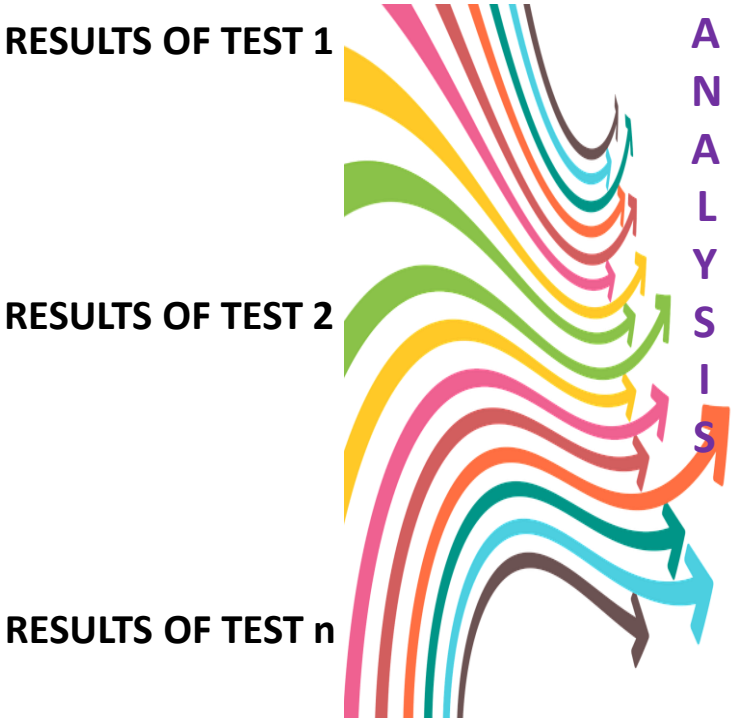


5. Development of the results of testing process models and drawing conclusions on their basis



- review of the obtained results
- analysis of factors which may influence the teaching results after using the processes (including the identification and analysis of possible cultural aspects)
- characterization of teaching processes and methods whose application leads in the most effective way to the development of transversal competences among students
- preparation of full documentation of reference models of tested processes

Stages of the method

ACCELERATE
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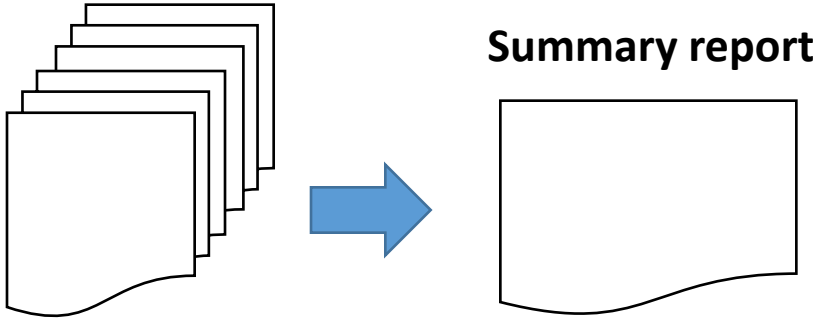
COMPETENCES

6. Selection of the most effective teaching processes or methods

Partial reports



In the sixth stage the summary report is developed. It includes results of the effectiveness of the methods and processes of practical training regarding the development of transversal competences in the aspects of:

- change in the level of competences (ΔC)
- rate of change in the level of competences (R)
- acceleration of competences' development (a)

a_{i+1} – acceleration of the development of transversal competences obtained as a result of using the (i +1) method

R_i – rate/speed of an increase in transversal competences in the i-th method of practical training

R_{i+1} – rate/speed of an increase in transversal competences in the i-th method of practical training following the i-th method

t_{i+1} – time of practical education using the (i +1) method

$$\Delta C = \sum_{i=1}^{n} \Delta C_i$$

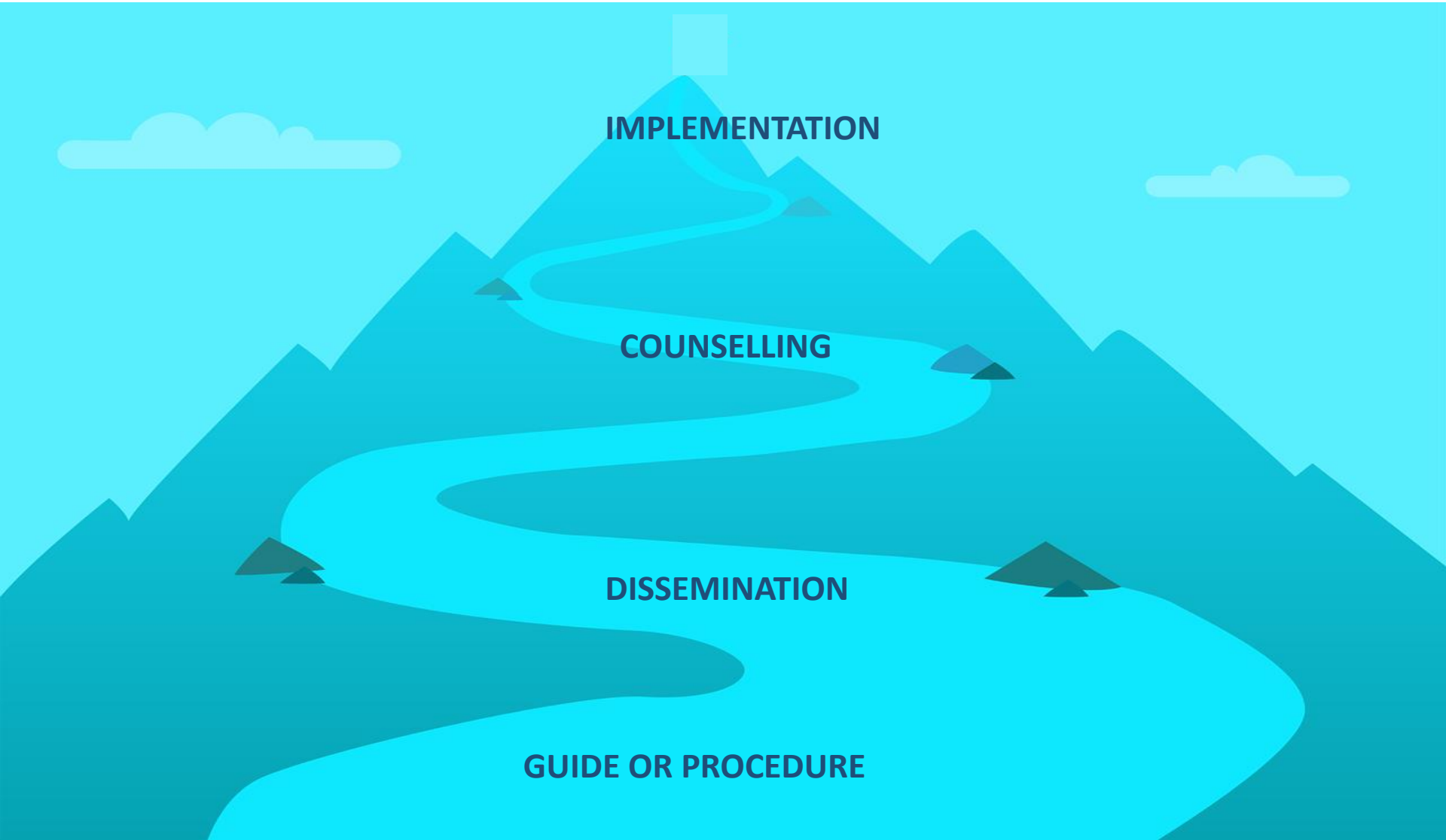
$$R = \frac{\Delta C}{t}$$

$$a_{i+1} = \frac{R_{i+1} - R_i}{t_{i+1}} \qquad a_p = \frac{\Delta R_p}{t_p}$$

Stages of the method

ACCELERATE
TRANSVERSAL
COMPETENCES

7. Application of teaching processes



The presented project is one of the elements of inititive by Technical Knowledge Accelerator®

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Activities undertaken by Technical Knowledge Accelerator® fulfill two principal aims

Initiating activities for faster technical development

Initiating activities for the prevention of technical exclusion

Initiative of Technical Knowledge Accelerator® in the context of projects

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Social Initiatives (since 2007)

AWT® (od 2006)

Organisational Concept of Education of High-qualified Staff and Lifelong Vocation in the Wielkopolska Region on the level of vocational schools, secondary schools, postsecondary schools and colleges, professional development, excelling and consulting (2008)

Educational and vocational consulting system of the Wielkopolska region (2010-2012)

Acceleration Programme for Technical, Mathematical and Natural Science Knowledge in Poland (2008)

Nauka i Postęp

Partnership of science and progress (2010-2013)

The Wielkopolska System of Educational and Career Counselling

Training laboratories

Organisation of trainings and internships in business

An e-learning system

czas zawodowców

Time for Profesionals – Wielkopolska Professional Education (2012-2015)

Module education

Purchase of equipment for schools

Dissemination

The acceleration method of development of competences in the students' practical traning process transversal (2015-2018)

mobilne miasto

Integrated support system for access to information in urban space (2011-2012)

Wortal naukaipostep.pl

Multimedia and TV programme (A Scientific Shot)

Radio programme „Pimp my mind"

Scientific magazine Akademickie B+R

Electronic archive of technology

Research model of the effectiveness of the promotion of science

czas zawodowców BIS

The Acceleration Method of Development of Transversal Competences in Students' Practical Training Process

Erasmus+

Initiative of Technical Knowledge Accelerator®

prof. dr hab. inż. Adam Hamrol

prof. dr hab. inż. Tomasz Łodygowski

dr hab. inż., prof. nadzw. Magdalena Wyrwicka

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METHOD MODEL

ACCELERATE
TRANSVERSAL
COMPETENCES

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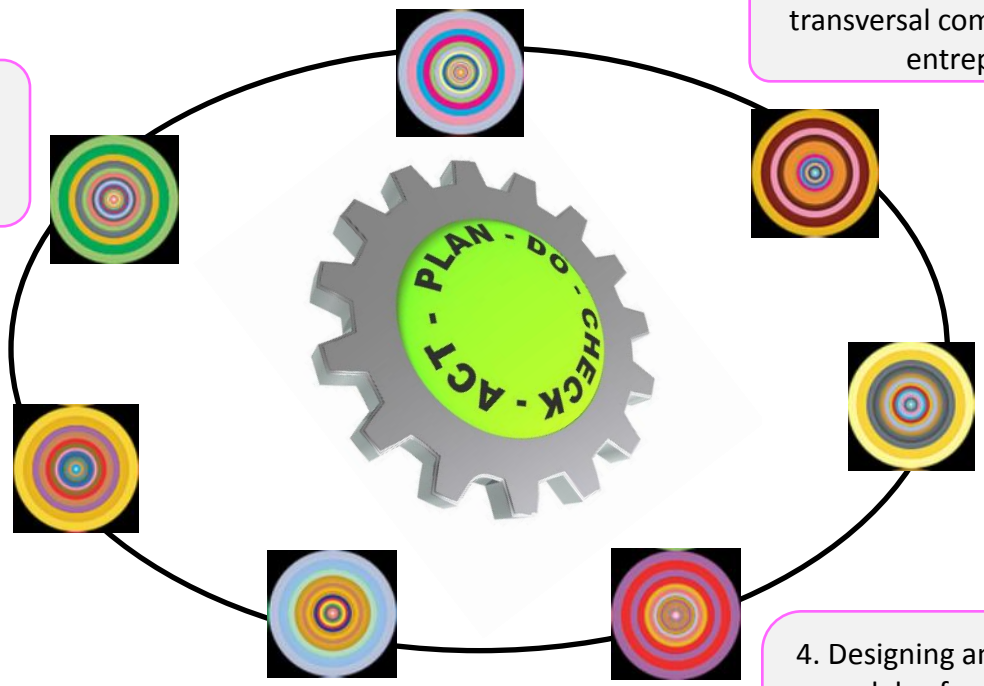

Stages of the method

ACCELERATE
TRANSVERSAL
COMPETENCES

3. Development of the matrix of the dependencies of practical teaching methods and teaching transversal competences

	Practical teaching method	Entrepreneurship (E)	Creativity (Cr)	Communicativeness (Com)	Teamwork (T)	Group of methods	Result
	Usefulness Index	0,26	0,25	0,24	0,25		
1	Brainstorming	7,74	9,96	7,68	7,53	Problem-solving methods	32,91
2	Group work/team work	5,16	5,48	8,16	10,04	Problem-solving methods/Activating methods	28,84
3	Exercises/trainings	6,97	6,23	7,44	7,78	Other methods	28,41
4	Case study	8,26	7,97	4,80	6,53	Problem-solving methods/Activating methods	27,55
5	Management training	7,48	6,23	6,48	6,28	Problem-solving methods/Activating methods/Demonstrating methods/Practical methods	26,46
6	Educational simulation games	7,48	7,22	4,80	6,02	Demonstrating methods	25,53
7	Cooperative methods	6,19	5,48	6,72	7,03	Other methods	25,42
8	Student work	6,97	6,23	6,00	5,77	Activating methods/Practical methods	24,96
9	Workshops	5,42	6,72	6,00	6,78	Practical methods	24,92
10	Practical classes	6,71	5,48	5,28	5,52	Practical methods	22,99
11	Problem solving	5,42	7,22	5,04	5,27	Problem-solving methods	22,95
12	Project method	6,97	6,72	3,84	5,02	Practical methods	22,55
13	Activating thinking	6,19	6,47	3,84	6,02	Other methods	22,53
14	Interships/practical training/ hands-on work experience, on the job learning/ working life experiences	5,42	5,23	5,04	5,27	Other methods	20,96
15	Simulation	5,16	5,98	4,80	4,52	Practical methods	20,45
16	Start - up	6,45	6,23	3,60	3,77	Other methods	20,04
17	Business narrative	6,19	5,98	4,80	2,26	Problem-solving methods/Activating methods/Demonstrating methods/Practical methods	19,23
18	Courses	4,64	4,48	5,28	4,27	Programmed methods	18,67
19	Science clubs, student organizations	4,39	4,23	4,08	5,77	Other methods	18,47
20	Consultations	5,68	3,98	4,80	3,51	Other methods	17,97
21	Work placement study activities	4,90	3,74	4,56	4,77	Practical methods	17,97
22	Lectures delivered by eminent speakers representing the world of science, business and politics	6,45	5,23	3,60	2,51	Other methods	17,79
23	Problem lecture	4,90	5,23	4,08	3,51	Problem-solving methods	17,73
24	Employed using a computer	4,39	4,73	5,04	3,01	Programmed methods	17,17
25	Collaborative learning methods	3,35	3,74	4,56	5,27	Other methods	16,92
26	Travel	3,87	5,48	4,80	2,76	Activating methods	16,91
27	Panel discussion	3,87	4,23	6,00	2,51	Problem-solving methods	16,61
28	Shows	2,32	5,48	5,28	3,51	Demonstrating methods	16,59
29	Blended learning	4,90	4,73	3,12	3,77	Other methods	16,52
30	Laboratory classes	3,87	4,23	3,12	4,27	Practical methods	15,49
31	Business incubators	6,45	2,49	2,88	3,26	Other methods	15,08
32	Mind mapping	2,58	6,97	2,64	2,76	Programmed methods	14,95
33	Contest	5,42	4,73	2,64	2,01	Problem-solving methods/Activating methods/Practical methods	14,80
34	Conferences, symposiums	3,35	3,74	5,52	2,01	Other methods	14,62
35	Employed using e-learning	3,10	3,98	3,84	3,51	Programmed methods	14,43
36	Excursions	4,64	4,48	3,36	1,76	Activating methods/Practical methods	14,24
37	Seminar	3,61	4,48	3,84	2,26	Practical methods	14,19
38	Business Model Canvas	5,42	4,23	1,44	2,51	Problem-solving methods/Activating methods	13,60
39	Students' participation in research activities run by higher education institutions	3,10	3,49	2,88	4,02	Other methods	13,48
40	Instruction	3,10	2,99	3,84	3,26	Programmed methods	13,19
41	Fieldwork	3,61	2,99	2,88	3,51	Practical methods	12,99
42	Measurement of the objectives	4,39	3,74	1,92	2,51	Demonstrating methods	12,55
43	Seminar papers	3,35	2,74	3,60	2,51	Problem-solving methods/Activating methods	12,20
44	Guided tours (e.g. in companies)	3,35	3,74	2,64	2,01	Other methods	11,74
45	Employed using mobile Apps	2,84	3,24	3,60	2,01	Programmed methods	11,68

Stages of the method

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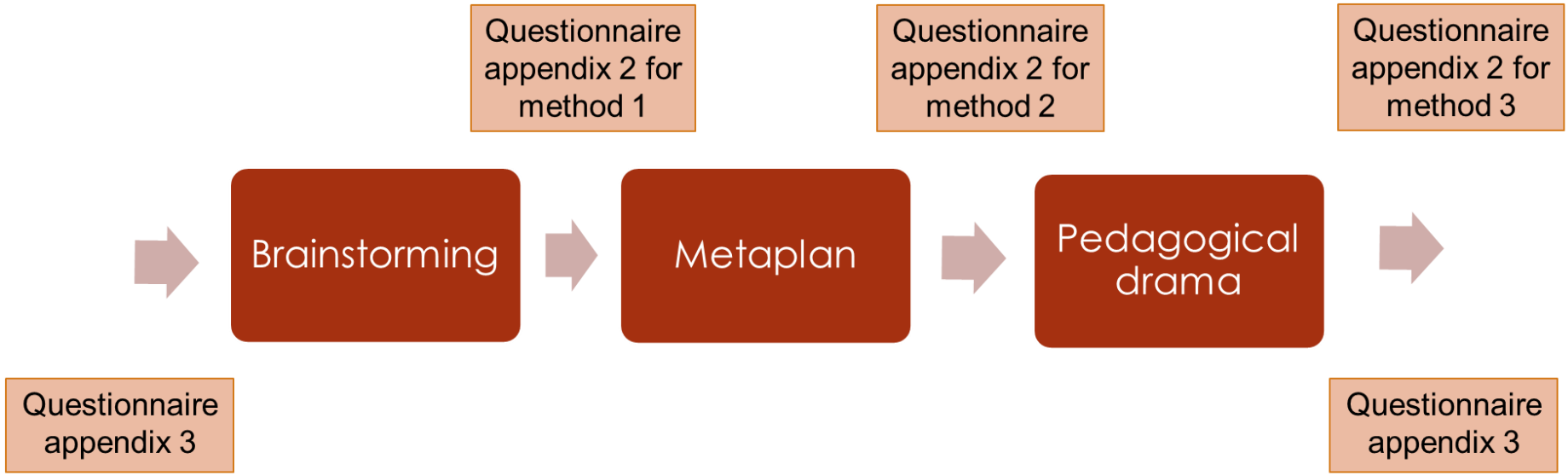
4. Design and testing of models of processes developing transversal competences as part of practical training.



Questionnaire appendix 2 - to measure the dynamics of changes in the evolution of acquired transversal competences (degree of change)

Questionnaire appendix 3 - for assessment of the evolution of transversal skills level of the students in practical teaching process (the level of possessed skills)

Stages of the method

ACCELERATE TRANSVERSAL COMPETENCES

4. Design and testing of models of processes developing transversal competences as part of practical training.

Number of method in the process	Practical teaching method	Quartile	Rank	Entrepre-neurship (E)	Creativity (Cr)	Communi-cativeness (Com)	Teamwork (T)	Group of methods	Result
1.	Brainstorming	I	3	0.97	1.25	0.96	0.94	Problem-solving methods	4.11
2.	Metaplan	I	8	0.95	1.08	0.88	0.92	Problem-solving methods	3.83
3.	Pedagogical drama	II	19	0.77	1.00	0.72	1.00	Other methods	3.49

Stages of the method

ACCELERATE TRANSVERSAL COMPETENCES

4. Design and testing of models of processes developing transversal competences as part of practical training.

	Method I (brainstorming)	Method II (metaplan)	Method III (pedagogical drama)
Testing start day	27.02.2017	13.03.2017	16.03.2017
Testing start time	8:45	12:00	8:00
Testing end day	13.03.2017	13.03.2017	16.03.2017
Testing end time	12:00	14:45	10:30
Duration of testing (min)	180	150	135
Number of meetings with students	3	2	2
Number of dean's groups	4	4	4
Number of test groups during a meeting	4	4	4
Average size of test groups during a meeting	30	22	27
Number of instructors	1	2	3
Number of courses/subjects where methods were tested	1	1	1
Type of activity	internet and mobile marketing	motivation systems	internet and mobile marketing
Language of communication	Polish		
Nationality of testers	POLAND		

Stages of the method

ACCELERATE
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5. Development of the results of testing process models and drawing conclusions on their basis

M1 - brainstorming						M2 - metaplan					M3 - pedagogical drama				
Student No.	M1 Entrepreneurship (average)	M1 Creativity (average)	M1 Teamwork (average)	M1 Communicativeness (average)	AVERAGE AFTER M1	M2 Entrepreneurship (average)	M2 Creativity (average)	M2 Teamwork (average)	M2 Communicativeness (average)	AVERAGE AFTER M2	M3 Entrepreneurship (average)	M3 Creativity (average)	M3 Teamwork (average)	M3 Communicativeness (average)	AVERAGE AFTER M3
110600	3.50	3.67	4.86	4.13	4.13	2.50	3.00	3.71	3.50	3.25	3.00	2.67	3.14	3.00	3.00
110633	1.67	1.67	1.57	0.50	1.25	1.67	1.33	1.43	0.63	1.21	1.17	1.33	0.71	0.88	0.96
110638	0.83	1.33	0.43	0.50	0.67	0.17	1.00	1.43	0.75	0.83	0.67	1.00	1.29	1.00	1.00
110641	1.50	3.00	2.29	2.88	2.38	3.33	4.00	4.29	3.63	3.79	1.83	3.33	3.86	3.25	3.08
110642	1.83	1.67	1.57	0.88	1.42	1.33	0.33	0.57	1.00	0.88	1.17	0.67	3.86	4.50	3.00
110644	3.50	3.67	3.86	3.38	3.58	3.50	2.67	2.86	3.00	3.04	2.33	3.00	3.00	2.50	2.67
110656	3.40	3.33	4.00	3.75	3.54	2.33	2.33	2.71	2.25	2.42	1.33	1.33	0.71	0.50	0.88
110681	1.33	1.00	0.86	0.88	1.00	1.50	0.33	1.00	0.63	0.92	1.50	0.33	2.29	2.00	1.75
110682	2.33	1.33	1.57	0.63	1,42	1.00	2.00	1.71	1.13	1.38	0.50	0.00	0.86	0.88	0.67
110696	3.83	4.00	4.14	2.56	4.17	3.17	4.00	4.14	3.38	3.63	2.17	3.33	2.71	3.50	2.92
111177	0.17	0.33	0.57	0.38	0.38	1.17	1.33	1.71	1.63	1.50	0.83	1.00	1.14	1.13	1.04
111270	3.33	3.00	1.29	1.50	2.08	1.00	1.00	1.14	1.00	1.04	0.50	1.00	0.14	0.25	0.38
129607	1.50	1.00	2.00	2.13	1.79	2.83	2.00	2.86	2.13	2.50	1.83	1.33	1.43	1.88	1.67
129614	5.00	5.00	5.00	5.00	5.00	4.67	5.00	3.86	4.13	4.29	4.33	4.00	3.71	3.75	3.92
129647	2.00	2.00	3.00	1.25	2.04	4.00	4.00	3.86	3.00	3.63	3.00	3.00	3.43	2.75	3.04
129685	3.83	3.33	3.14	3.00	3.29	4.00	4.33	4.14	4.00	4.08	3.50	3.67	3.43	3.88	3.63
	2.44	2.46	2.51	2.20		2.39	2.42	2.59	2.23		1.85	1.94	2.23	2.23	

Stages of the method

ACCELERATE
TRANSVERSAL
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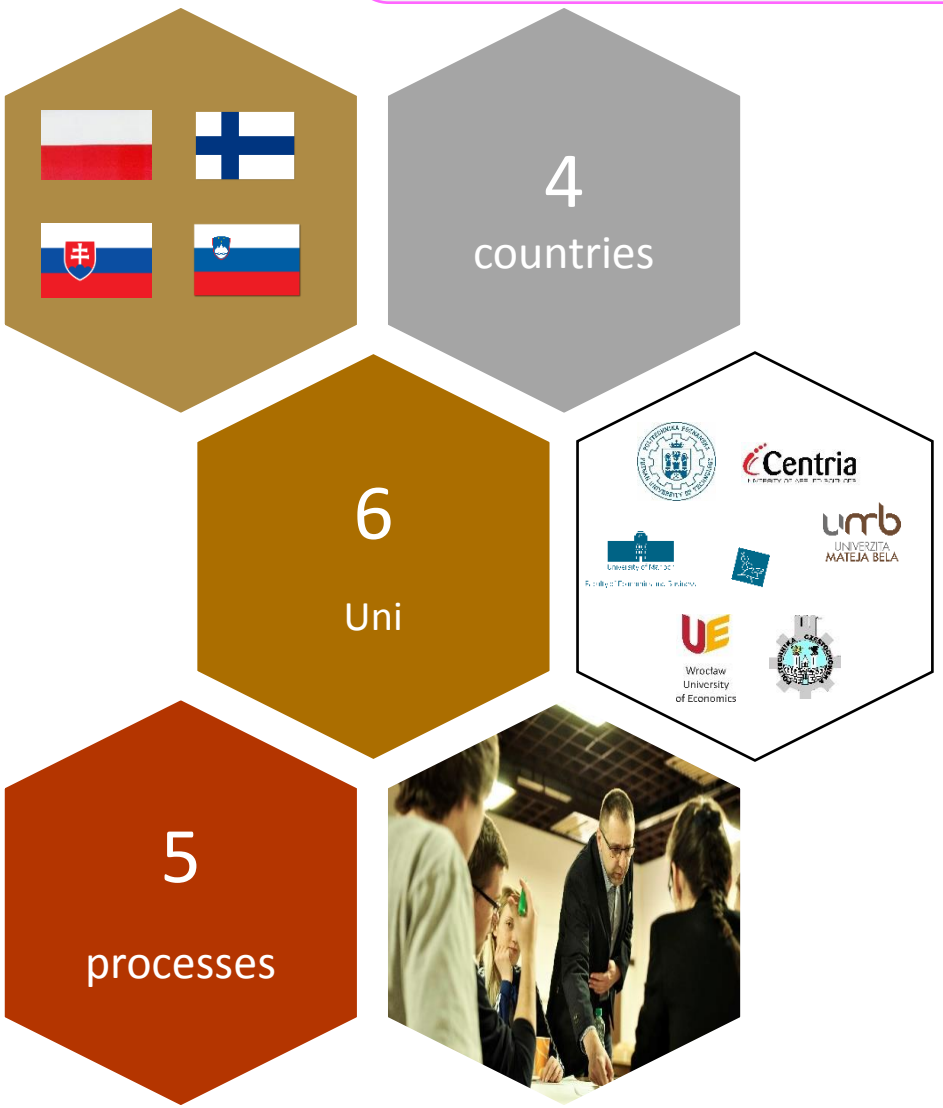
5. Development of the results of testing process models and drawing conclusions on their basis



Stages of the method

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COMPETENCES

6. Selection of the most effective teaching processes or methods

Report I

Report II

Instruction – analysisc of each process

Comparing procesess

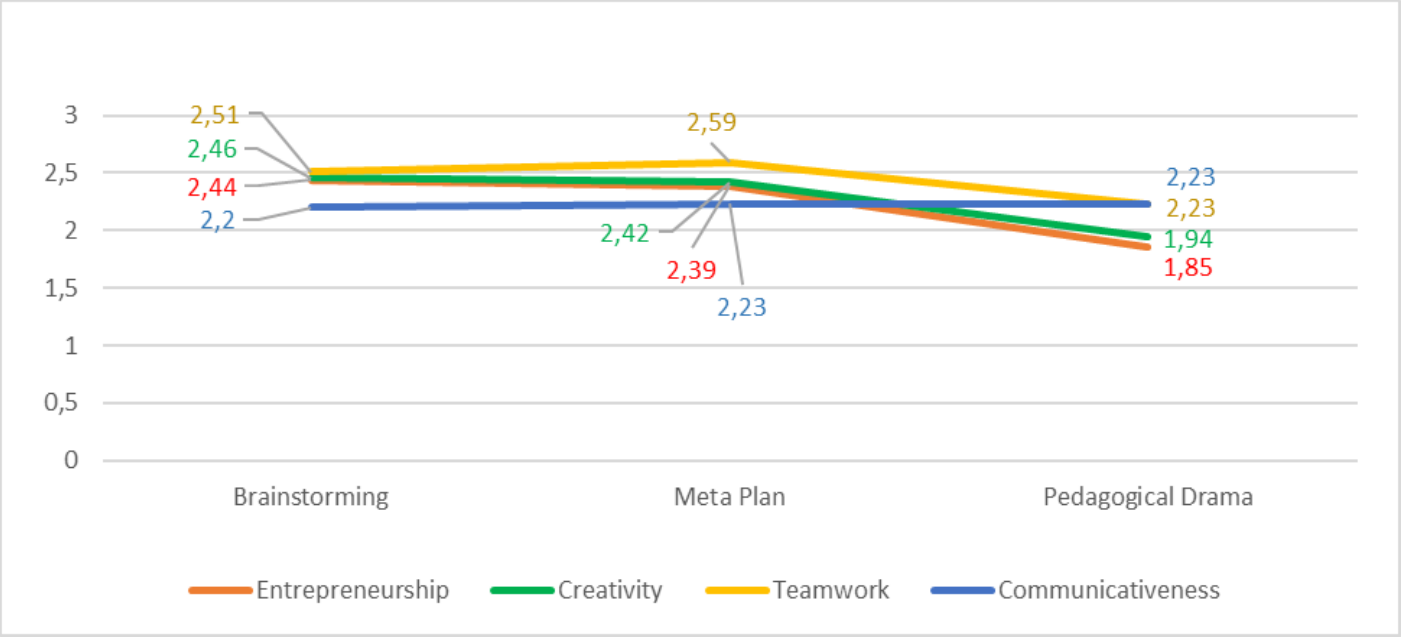
Analysis of the factors influenced the processes

Stages of the method

ACCELERATE
TRANSVERSAL
COMPETENCES

6. Selection of the most effective teaching processes or methods

Report I



Values of the rate of an increase in all component skills of transversal competences: "entrepreneurship", "creativity", "teamwork", "communicativeness" (averages of students' self-assessment -process 1 / PUT).

Stages of the method

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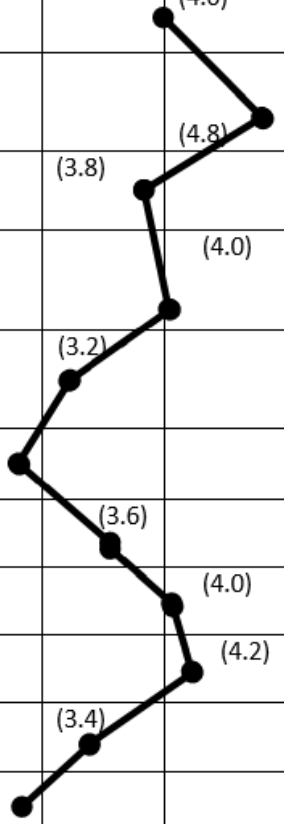
6. Selection of the most effective teaching processes or methods

Report II

Factor	1	2	3	4	5
Applying innovative methods and forms of work with students				(4.0)	
Active inclusion of students in the learning process				(4.8)	
Maintaining an acceptable and at the same time dynamic pace of knowledge acquisition			(3.8)		
Appropriate organization of classes, among others, defining the purpose of the classes				(4.0)	
Providing various forms of acquiring knowledge, among others, in an independent way and in different size groups			(3.2)		
Making reference to the already acquired knowledge of students		(2.8)			
Taking into account the individual possibilities and styles of students' learning			(3.6)		
Formulating and asking key questions during classes				(4.0)	
Using feedback from students				(4.2)	
Being able to maintain concentration in a group of students			(3.4)		
Taking into account peer assessment and self-evaluation		(2.8)			



Factors associated with teaching methodology and assessments of their impact on the test results.

Stages of the method

ACCELERATE
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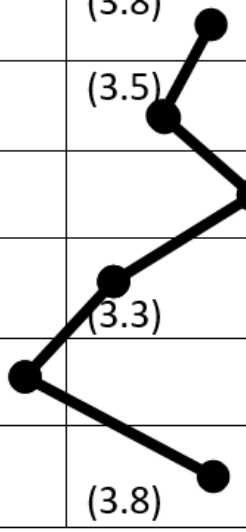
COMPETENCES

6. Selection of the most effective teaching processes or methods

Report II

Cultural factor	1	2	3	4	5
Power Distance			(3.8)		
Uncertainty Avoidance			(3.5)		
Individualism				(4.0)	
Long Term Orientation			(3.3)		
Masculinity		(2.8)			
Indulgence			(3.8)		



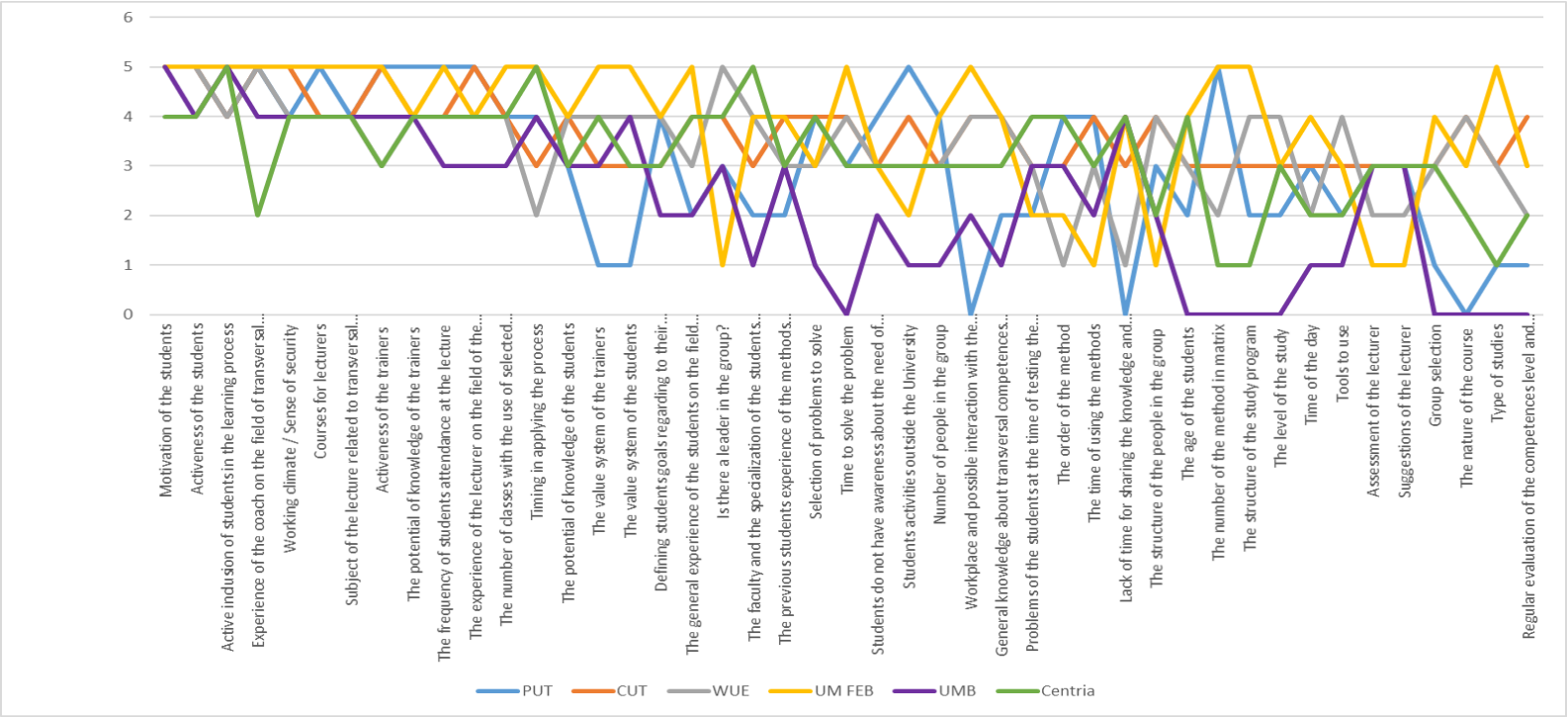
Cultural factors and average assessments of their impact on the test results

Stages of the method

ACCELERATE
TRANSVERSAL
COMPETENCES

6. Selection of the most effective teaching processes or methods

Report II



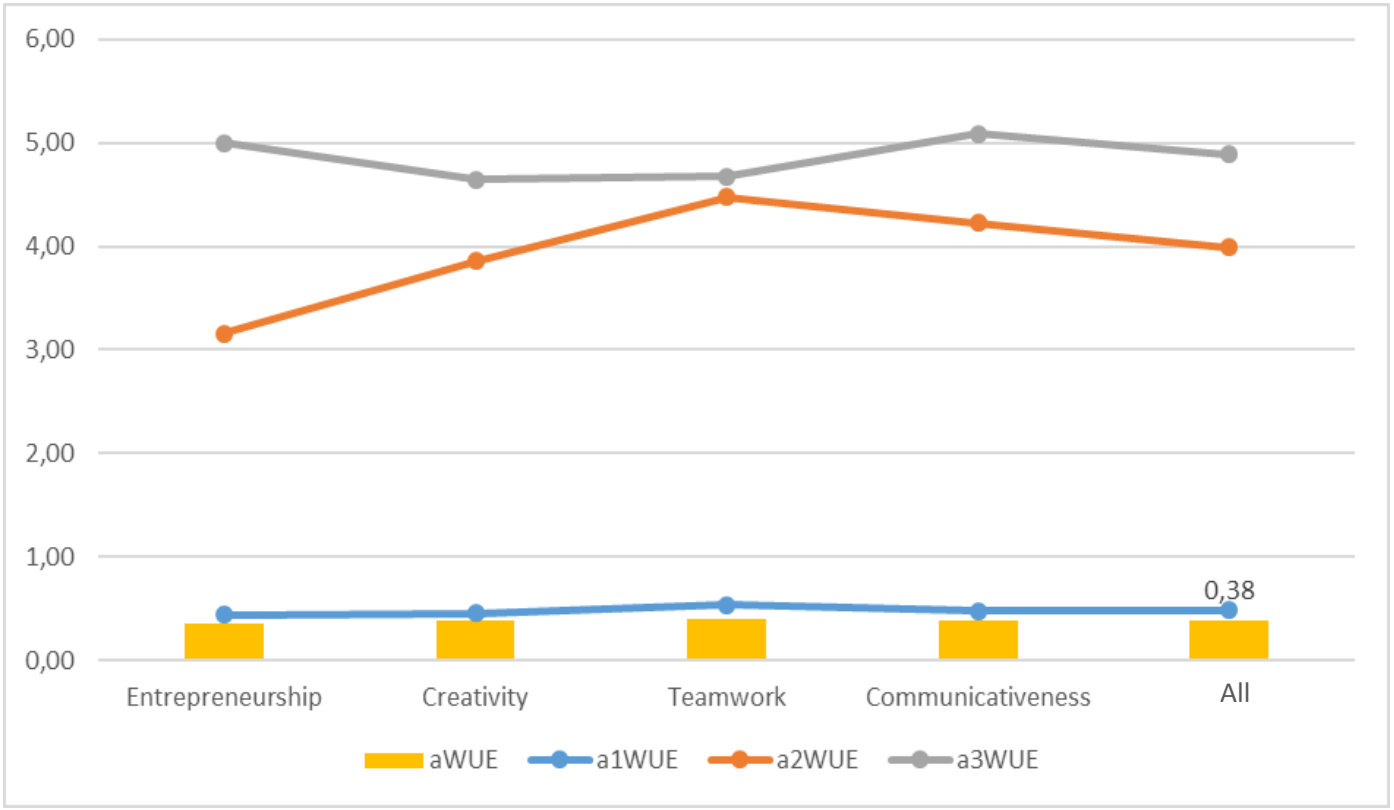
Other factors and average assessments of their impact on the test results

Stages of the method

ACCELERATE
TRANSVERSAL
COMPETENCES

6. Selection of the most effective teaching processes or methods

Report II



Impact of MPE and WUE PTP on acceleration (a) of TC development.

$$\Delta C = \sum_{i=1}^{n} \Delta C_i$$

$$R = \frac{\Delta C}{t}$$

$$a_{i+1} = \frac{R_{i+1} - R_i}{t_{i+1}} \qquad a_p = \frac{\Delta R_p}{t_p}$$

Stages of the method

ACCELERATE
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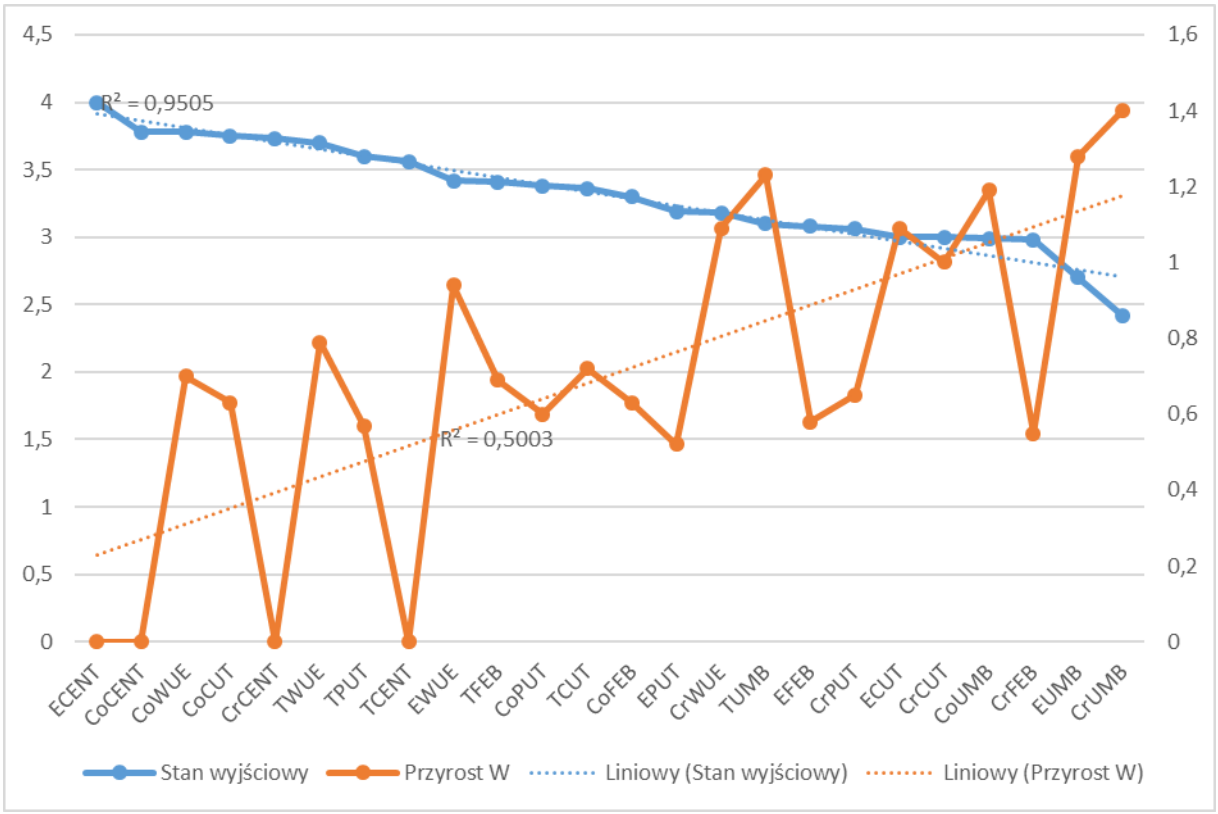
Report II

6. Selection of the most effective teaching processes or methods



The relationship between the initial state of transversal competences and their increase as a result of the use of MPE methods. Own elaboration.

Further work

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Small Data *Analytics* with MARS for Knowledge Acceleration by Competences

After including **Time** as another input variable, the MARS model shows some improvement:

- Based on MAPE (mean absolute percentage error), accuracy error is around 17% - **better** than without the input variable **Time**.
- The following variables turned out to be ***significant***:

  Average Acceleration of Creativity,
  Average Acceleration of Communicativeness,
  Number of Students,
  Rank of the Method in Matrix,
  Average Acceleration of Teamwork,
  Starting Time of the Method.

Gerhard-Wilhelm Weber
Ayşe Özmen,
Magdalena Graczyk-Kucharska
Maciej Szafrański, Marek Golinski,
Małgorzata Spychała

Further work

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- We study on **3 different MARS models** with **26 inputs** and different data sets.

- For **Model 1**, $\hat{Y}_1$, we apply MARS algorithm on **100** data with considering first 17 inputs.
- For **Model 2**, $\hat{Y}_2$, we extend our data size and we obtain MARS model using **340** data with regard to same (first **17**) inputs.
- For **Model 3**, $\hat{Y}_3$, to improve our model performance, especially based on MAPE, we add **Time** as a new input and we use MARS algorithm on **340** data with regard to **26** inputs.

Y	Average acceleration of Entrepreneurship	X_{14}	Masculinity (Hoffstede)
X_1	No of students	X_{15}	Uncertainity Avoidance (Hoffstede)
X_2	Rank of the method in matrix	X_{16}	Long-Term Orientation (Hoffstede)
X_3	No of the method in the process	X_{17}	Indulgance (Hoffstede)
X_4	No of the process	X_{18}	Timeline of the process
X_5	Size of tested group	X_{19}	Timeline of the method
X_6	Number of meetings	X_{20}	Start of the process
X_7	Number of test groups	X_{21}	End of the process
X_8	Duration of testing (min)	X_{22}	Starting time of the method
X_9	Average acceleration of Creativity	X_{23}	Ending time of the method
X_{10}	Average acceleration of Communicativeness	X_{24}	Cycle of the study
X_{11}	Average acceleration of Teamwork	X_{25}	Year
X_{12}	Power Distance (Hoffstede)	X_{26}	Semester
X_{13}	Individualism (Hoffstede)		

Further work

ACCELERATE TRANSVERSAL COMPETENCES

- For **Model 3**, , is assigned as 30, and the highest degree of interaction as 4. Following the Backward Stage of MARS, the number of BFs is shortened to 14. Consequently, the optimal **MARS Model 3** is represented as:

$$\hat{Y}_3 = \alpha_0 + \alpha_1 \max\{0,\ 3.33 - x_3\} + \alpha_2 \max\{0,\ x_4 - 0.25\}$$
$$+ \alpha_3 \max\{0,\ 35 - x_1\}\cdot\max\{0,\ x_4 - 0.25\} + \alpha_4 \max\{0,\ x_6 - 5728\}$$
$$+ \alpha_5 \max\{0,\ x_1 - 104\} + \alpha_6 \max\{0,\ 104 - x_1\}$$
$$+ \alpha_7 \max\{0,\ 19 - x_2\} + \alpha_8 \max\{0,\ x_5 - 0.143\}\cdot\max\{0,\ x_2 - 19\}$$
$$+ \alpha_9 \max\{0,\ x_3 - 0\}\cdot\max\{0,\ x_2 - 19\}$$
$$+ \alpha_{10}\, \mathrm{m}\max\{0,\ x_4 - 2.75\}\cdot\max\{0,\ 0.143 - x_5\}\cdot\max\{0,\ x_3 - 0\}\cdot\max\{0,\ x_2 - 19\}$$
$$+ \alpha_{11} \max\{0,\ x_1 - 45\}\cdot\max\{0,\ x_3 - 3.33\}$$
$$+ \alpha_{12} \max\{0, 45 - x_1\}\cdot\max\{0,\ x_3 - 3.33\}$$
$$+ \alpha_{13} \max\{0, 1.87 - x_4\}\cdot\max\{0,\ 5728 - x_{22}\}$$
$$+ \alpha_{14} \max\{0, x_2 - 3\}\cdot\max\{0, 4.57 - x_5\}\cdot\max\{0, 45 - x_1\}\cdot\max\{0,\ x_3 - 3.33\}.$$

α_0	α_1	α_2	α_3	α_4	α_5	α_6	α_7
1.8094	-0.5714	0.3506	-0.0111	0.0041	-0.0614	0.0088	0.0193
α_8	α_9	α_{10}	α_{11}	α_{12}	α_{13}	α_{14}	
0.0096	-0.0089	-0.0666	0.0134	0.0203	-0.0001	0.0021	

Y	Average acceleration of Entrepreneurship
X_1	No of student
X_2	Rank of the method in matrix
X_3	Average acceleration of Creativity
X_4	Average acceleration of Communicativeness
X_5	Average acceleration of Teamwork
X_6	Starting time of the method

THE ACCELERATION METHOD OF DEVELOPMENT OF TRANSVERSAL COMPETENCES IN STUDENTS' PRACTICAL TRAINING PROCESS.

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